POPULAR AND SPECIAL PHYSICS.

(1) *Wireless Telegraphy and Telephony without Wires.* By C. R. Gibson. Pp. 156. (London: Seeley, Service and Co., Ltd., 1914.) Price 2*s.* net.

(2) *A Text-book of Physics.* By Dr. R. S. Willows. Pp. viii + 471. (London: Edward Arnold, n.d.) Price 7*s.* 6*d.* net.

(3) *Medizinische Physik.* By Prof. Otto Fischer. Pp. xx + 1120. (Leipzig: S. Hirzel, 1913.) Price 36 marks.

(4) *Principles of Thermodynamics.* By Prof. G. A. Goodenough. Second edition, revised. Pp. xiv + 327. (London: Constable and Co., Ltd., 1913.) Price 14*s.* net.

(1) MR. GIBSON'S book is a brightly written account of the development of wireless telegraphy, with just sufficient broadly popular explanations to give the ordinary reader the impression that he is understanding the nature of electricity and of electric waves. The historical sketch in chap. iv., in which the early suggestions and experiments of Steinheil, Morse (1844), Lindsay (1854), Trowbridge, and Preece (1882) find their due place, is very good reading, and the account of Lodge's syntonic jars and the improvements effected by Jackson, Righi, and Popoff brings out many points on which the ordinary man's memory has become somewhat hazy. Then comes Marconi's "antenna" and earthed apparatus, which increased the effectiveness of radiotelegraphy a hundredfold, and led to its most striking triumphs. From that time forward "wireless" and "Marconi" become almost synonymous among English speakers, but the German combination of the Braun-Siemens and Slaby-Arcs systems now known as the "Telefunken" system is allowed some space, and the American systems of de Forest and Fessenden, as also the Danish Poulsen system, are briefly described. A chapter on "telephoning without wires," a chronological table, and a short glossary of terms conclude a pleasing and eminently readable volume.

(2) Dr. Willows's "Text-book of Physics" treats the elementary phenomena rather more fully than do other works of a similar kind. One would suppose it to be intended mainly for self-tuition, to judge by the numerous examples (with answers) and the rather detailed style. The ground covered is the same as that already surveyed in countless physical works, and there is not much that is new, either in subject-matter or method of treatment, though one is pleased to see Callendar and Barnes's "J" apparatus, the hot-wire ammeter, and the moving-coil galvanometer duly explained. The illustrations are good, except Fig. 134 (erecting prism), which is incorrectly drawn. There are some minor shortcomings, such as the quite incredible explanation of osmotic pressure on p. 15, but on the whole it is a thoroughly useful and creditable work, which will no doubt be widely appreciated.

(3) A special work on "Medical Physics" is necessarily of a somewhat limited scope, but eclecticism has been carried almost to an extreme in Prof. Otto Fischer's substantial volume. It resolves itself into a collection of treatises on three or four chosen subjects. The first and most voluminous of these is the work on the kinematics and kinetics of linkages, with special reference to joints. It gives graphic methods for the kinematic analysis of the empirically determined motion of a point, and methods of compounding translational and rotational velocities, demonstrates the equivalence of the most general finite displacement of a body in space with a screw motion, and reduces the kinetics of manifold linkages to the kinetics of single, rigid bodies. Many examples are given, and the mathematical treatment is reduced to its simplest terms. One cannot help wishing that this portion of the book had been published separately, as it is self-contained, and the whole work, weighing more than 4 lb., makes an unwieldy handbook. The remainder of the volume gives certain chapters of acoustics and optics. The former comprise stationary and progressive waves, sound analysis, the physics of the ear, and the voice mechanism. The optical portion is a treatise on geometrical optics, the microscope, and the polarimeter. Only twelve pages are devoted to the human eye. If it were not for the many numerical problems and examples which form the most valuable feature of this work, one would scarcely see much prospect of it successfully competing with its many rivals. In a work on medical physics, one would have expected something on the motion of liquids in elastic and capillary tubes, on osmose and dialysis, on thermometry and hygrometry, on spectroscopy, on string galvanometers, nerve currents, and cardiograms. All this is conspicuous by its absence. It is a pity to see the utility of this otherwise admirable work curtailed by such faults of publication and presentation.

(4) Prof. Goodenough's "Thermodynamics" aims primarily at laying an adequate foundation for the advanced study of heat engines. The treatment of the fundamental laws is that of Bryan, which identifies the "second law" with the law of degradation of energy, and defines entropy in terms of unavailable energy. Chapters

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x. and xi. give an account of the recent experiments on saturated and superheated vapours made in the Munich laboratory, and by Marks and Davis, and new equations for the specific heat, entropy, energy, and heat content of superheated steam are deduced and published for the first time. Throttling and "wire-drawing" are treated very fully, and a concise discussion of the various types of steam turbines and refrigerating apparatus using vapour media brings this useful and eminently practical volume to a close.

THREE BOOKS ON ENTOMOLOGY.

(1) *The Entomologist's Log-Book, and Dictionary of the Life Histories and Food Plants of the British Macro-Lepidoptera.* By A. G. Scorer. Pp. vii + 374. (London: George Routledge and Sons, Ltd., 1913.) Price 7*s*. 6*d*. net.

(2) *The Fauna of British India, including Ceylon and Burma.* Edited by Dr. A. E. Shipley, assisted by Guy A. K. Marshall. *Diptera nematocera* (excluding Chironomidæ and Culicidæ). By E. Brunetti. Pp. xxix + 581 + xii plates. (London: Taylor and Francis; Calcutta: Thacker, Spink and Co., 1912.) Price 20*s*.

(3) *Handbuch der Entomologie.* Herausgegeben von Prof. Chr. Schröder. Lieferung 1–3. Pp. iv + 480. (Jena: Gustav Fischer, 1912–13.) Price 15 marks.

(1) "THE Entomologist's Log-Book," compiled by Mr. Scorer, should be extremely useful to all those who for any reason are interested in the natural history of our British butterflies and larger moths. Not only the ordinary collector, but also the worker in bionomic problems and the economic entomologist will find here information of value in easily accessible form. The arrangement of the book is alphabetical, the names of both insects and plants occurring in their proper order, so that reference to any item that may be wanted can be found at once. Under the name of each plant is given a full list of the Macrolepidoptera that feed upon it; while as to the insects themselves, it would be difficult to adduce any well-authenticated fact of their life-history which is not duly recorded in the appropriate place. We have tested the data in several particulars, and have found them accurate and trustworthy as representing existing knowledge. There are still gaps in our information as to life-histories; many of these, it is to be hoped, will be filled up by the help of Mr. Scorer's book, the usefulness of which is enhanced by interleaving with blank pages.

(2) The names of the editors and author of the recently published volume of the "Fauna of British India," dealing with the *Diptera nematocera*, are a sufficient guarantee that the work is worthy of the admirable series to which it belongs. The study of the two-winged flies, besides its intrinsic scientific interest, derives great importance from the influence exercised by members of the order upon agriculture and forestry, and their intimate connection with various forms of disease. Mr. Brunetti's work bears the impress of much minute and careful investigation; and the sections devoted to the external anatomy, the life-history of the early stages, and the classification of the Diptera are as valuable in their way as the more distinctively systematic portion. The plates of wing-venation and other details are well executed and clear.

(3) The first three parts of the elaborate "Handbuch der Entomologie," issued under the editorship of Prof. Schröder, contain chapters by Prof. Deegener, of Berlin, on the integuments and cutaneous organs, on the nervous system and organs of sense, the alimentary tract with its appendages, the organs of respiration and circulation, the body-cavity, the musculature and endoskeleton of insects. Dr. Prochnow adds a section on stridulating and other sound-producing organs. The portion at present published, which runs to nearly 500 pages, is less than a quarter of the work as it will ultimately appear. It will be seen, therefore, that the treatise has been planned on an extensive scale. The parts now before us constitute the fullest connected account as yet available of the departments of insect morphology with which they deal. The execution of the work is for the most part good, and the figures reach a high standard of merit. The bibliography, though in places not quite complete, has evidently been compiled with great care.

In a general work of this kind, however excellent, it usually happens that the student of special points finds something to criticise. There is no exception here; the section devoted to scent-glands contains several statements that are open to question, and a figure is borrowed from Illig which purports to represent a plume-scale from *Pieris napi*, but gives a very erroneous idea of that structure. Freiling, from whom several figures are taken, though cited in the text, appears to have no place in the bibliography. But slips of this kind are rare. It is worth noting that the remarkable conclusions on pupal assimilation announced by the Gräfin von Linden (see NATURE, vol. xc., 1913, p. 379) are considered by Prof. Deegener to be unwarranted by the existing evidence.

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